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The Geography of Occupational Concentration among Low-Skilled Immigrants

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Abstract

Employment concentration among low-skilled immigrants is a well-documented phenomenon in the U.S. labor market though its temporal and spatial patterns are less well examined. With Census microdata, we trace detailed occupational niches from 1990 to 2010 for all immigrants as well as Asian and Latino immigrants separately to understand how these niches have evolved over the past two decades. Using the Herfindahl-Hirschman index (HHI) measure, we further capture the geographic variation in relative occupational concentration across Metropolitan Statistical Areas (MSAs) and test what metropolitan-level contexts and policies help explain such differences. We find that metropolitan areas with larger total and immigrant populations, greater human capital, higher residential mobility, and more diverse economies have expanded low-skilled immigrants' occupational choices. Conversely, policies such as higher minimum wages and greater union membership may in fact increase occupational concentration, at least for some groups.

Introduction

Labor market segmentation by race/ethnicity, gender and national origin has been recognized as a prominent feature of urban labor markets across the United States. Immigrant workers tend to be highly specialized and are concentrated in limited industries and occupations in metropolitan areas from New York (Waldinger, 1996) to Los Angeles (Ellis &Wright, 1999).

That is partially because immigrants rely on social networks in their job search, as ethnic networks connect newcomers to their settled co-ethnics and facilitate the job matching process. As a result, job networks help shape the segmentation of the labor market along ethnic lines and the formation of certain industries and occupations where workers with the same origins heavily cluster. Termed as an ethnic niche (Waldinger, 1994) or ethnic niching (Wilson, 2003), these over-represented employment concentrations serve as important nodal points in organizing the labor market experience of immigrants.

The prevalence of ethnic niches in organizing low-skilled immigrants' labor market arrangements and their relative pay penalty is well documented, especially in the established gateways of Chicago, New York and Los Angeles (Catanzarite 2000; Bohon 2005; Ellis et al, 2007) and more recently in the emerging gateways like Atlanta and Washington, D. C. (Hudson, 2002; Liu, 2011). Ethnic niching is found to be most evident among the new arrivals, those without sufficient English skills, and those of Mexican origin. As they lack the skills and experience to compete successfully in the open labor market, niche jobs obtained from ethnic networks might be their safe havens when entering a new labor market. However, niche-employed low-skilled Latino immigrant workers receive significantly lower annual wages than comparable non-niche-employed workers as they receive lower returns to skills and experiences (Liu, 2011). The reinforcement of their respective niches also tends to create closure to other ethnic groups and intensify inter-group competition (Liu, 2013).

While studies have traditionally focused on cases of a few metropolitan areas or the nation, we know little about how such dynamics vary across different metropolitan areas longitudinally. Chetty et. al (2014) powerfully demonstrated the uneven geography of intergenerational mobility serves as a clear demonstration of how mobility patterns vary across

cities. Context of reception, which refers to the economic, social, and institutional framework of the local areas where immigrants settle, is important in understanding immigrants' socioeconomic mobility in different metropolitan areas. Analysis performed at the metropolitan area level demonstrate that immigrants' occupational diversity, employment outcomes, economic integration and resilience are shaped by a series of local demographic, socioeconomic, and policy factors (Christopher and Leslie 2015; Liu and Edwards, 2015; Lester and Nyugen 2016).

The U.S. economy has undergone significant shifts over the past few decades. Within this context, how stable or persistent is the low-skilled labor market for the immigrant population in terms of their occupational distribution and how do these patterns vary geographically? Using microdata from 1990 to 2010 from the decennial census and the 2010 5-year American Community Survey for largest 100 Metropolitan Statistical Areas, we trace changes in immigrants' occupational niches over the past two decades. We also characterize their occupational distribution and explore what MSA-level contextual factors help explain the geographic variations in occupational dynamics. We show, among other things, that metropolitan areas with larger immigrant population, higher human capital, greater residential mobility and more diverse economies expand immigrants' occupational opportunities. The effects of policies, such as more affordable housing, minimum wage and unionization are also tested. We contribute to the literature by examining the temporal and spatial dynamics of immigrants' low-skilled employment concentration and suggesting pathways through which localities can potentially provide more opportunities for low-skilled immigrants.

Literature Review

Ethnic Niches and their Quality

Employment niche is a well-established concept that describes the over-representation of immigrants and minority workers in certain industries and occupations (Model, 1993; Waldinger, 1994; Liu, 2013). Researchers have developed multiple explanations for ethnic niching including neo-classical economic/human capital theory, segmentation/social capital theory, and succession theory (see Christopher and Leslie 2015 for review). Literature suggests that those with the highest probability of working in a niche are new arrivals, those without sufficient English skills, and those with networks of workers within the niche (Liu, 2011). As newly-arrived immigrants turn to their established co-ethnic workers for help in their job search and employers use ethnic referral as potential quality assurance, ethnic niches are created, reinforced, and bounded by language and other social ties.

While the existence of niches is well established, how it affects job prospects for immigrants is more controversial. Niches may act to protect immigrant workers, particularly new arrivals, help to shorten periods of unemployment and even increase wages for the entire group. Model (1993) found that when immigrants discovered work through their networks they were more likely to find higher-paid occupations and Patel and Vella (2013) found a wage premium for workers in a niche relative to those of the same group outside the niche. Wilson (1999) had the opposite finding, that being in an ethnic niche did not provide higher wages or protection from unemployment in the general immigrant population. Similarly, drawing on evidence from three metropolitan areas, Liu (2011) concluded that niche employment is almost uniformly characterized by earnings disadvantage as compared to non-niche employment with lower returns premium.

An equally important question is whether niches provide a launching pad to find better work, or are immigrants stuck in the same niches over time. While most studies examine niche

employment in a given year, there are a few exceptions. Patel and Vella (2013) found that new arrivals were highly likely to choose the same occupations that previous generations of immigrants in the same region had selected. Conversely, studying Atlanta, Liu (2013) traced low-skilled immigrants' niches from 1990 to 2008 and established their relative consistency over time. Furthermore, it was found that immigrants increasingly gravitated towards manual-intensive craftsmen, operative, and farm occupations, which tend to create closure to other groups and intensify inter-group competition. However, we do not know if the same patterns apply to other metropolitan areas. If niche employment is associated with lower pay, then greater participation in a wide range of occupations would be a desirable outcome for low-skilled immigrants and signals an increased level of economic integration in the local economy. Thus, we will identify their respective niches for the past two decades of low-skill immigrants to understand the changing employment patterns as well as niching propensity over time.

Immigrants' Niche Employment in Metropolitan Context

The formation and evolution of immigrant niches are tied to local context, beyond immigrants' own group characteristics. Immigrants enter into local labor markets with different industrial structures and demographic characteristics, and face diverse policy and institutional environments. These place-based contextual factors act upon immigrants' human capital attributes in shaping their employment outcomes (Portes & Bach, 1985; Ellis, 2001). Liu and Edwards (2015) found that Latino immigrants fared worse through the Great Recession in areas with high immigrant concentration but experienced employment gains in the South, large urban economies, as well as new immigrant gateways.

The majority of research on immigrant niches has been conducted through case studies in a few large cities, tough the niches that immigrant workers form vary across metropolitan areas. (e.g. Waldinger, 1994; Wang 2004; Bohon, 2005; Liu, 2011). For instance, Bohon (2006) examined several Latino immigrant groups in Chicago, Los Angeles, Miami, and New York and found some differences in the most common occupations for immigrants with the same national origin across different cities and from different national origins in the same city. Lim (2001) had a similar finding of varying occupational niches when studying African-Americans and immigrants in Chicago, Los Angeles, New York, San Francisco, and Miami. Both attribute such variations to metropolitan contextual factors, though limited case study cities preclude testing of specific factors.

In one of the few studies that analyze the niching phenomena at the metropolitan level for the entire nation, Wilson (2003) found modest continuity in niches as well as a broad divide nationally in the occupational patterns for native-born minorities and non-Europeans immigrants as opposed to immigrants from other regions. He suggested that the extent of ethnic niching is shaped by local population and labor market structure but was not able to directly test these associations. Christopher and Leslie (2015) studied the consistency of niches as well as the drivers of niche propensity in 26 different metropolitan areas for 42 immigrant groups, finding that areas with larger immigrant populations had a greater propensity to form large niches. Conversely, areas with larger total population, declines in employment, or increases in the share of residents not speaking English had smaller niches overall. Using immigrants' occupational diversity as a proxy measure for their economic integration, Lester and Nguyen (2015) argued that such difference in integration level would have implications for regional resilience through

the economic shock of the Great Recession. The most robust contextual factors they identified were the human capital and industrial structure of a region.

Building on these previous works, we expect that the relative divergence/specialization of low-skilled immigrants' occupations within the local labor market would be dependent on the demographic, socioeconomic, and policy environment within a metropolitan region. We hypothesize, among other things, that metropolitan areas with larger immigrant populations, higher human capital, greater residential mobility and more diverse economies would expand immigrants' occupational opportunities. The effects of policies such as increases in minimum wage and unionization are also examined.

Data and Methodology

Data

Our analysis draws from the U.S. Census' Public Use Microdata Sample (PUMS), specifically the 1990 and 2000 decennial Census, and the 2006-2010 5-year combined sample of the American Community Survey (ACS) (Ruggles et al, 2010). We conduct our analysis for the 100 Metropolitan Statistical Areas (MSAs) with the largest immigrant populations in 1990.[1] First, we trace the occupational niches of low-skilled immigrants for the past two decades to understand their persistence and evolution over time. Second, we capture the relative degree of their occupational concentration at the MSA level using a single index. Last, we test how metropolitan context and policy environment help shape these occupational patterns.

[1] PUMAs do not perfectly align or combine into MSAs and in most cases the regions are incompletely identified. According to the IPUMS website PUMAS are combined into MSAs based on a rule that the overlap must be greater than 50%; if the overlap is less than 50%, the entire PUMA is not placed in any MSA (IPUMS, 2018). In general, the core areas and central cities are more likely to be included in PUMS definition of MSAs than outlying parts near the border.

The sample for our study is low-skilled immigrants between the ages of 16 and 65 who are in the workforce and are not fulltime students, disabled, or self-employed. We consider any individual without a high school diploma or equivalent to be low-skilled, while medium-skill refers to those with high school educations but no college degree and high-skill individuals are individuals with a college degree or higher. Descriptive statistics for all three years of data for the full sample are shown in Table 1 below. The period between 1990 and 2010 witnessed growing participation of immigrants' in the total national workforce: immigrants made up 9.7 percent of all workers in 1990, a share which grew to 13.7 percent in 2000 and 16.5 percent in 2010. In addition, immigrants' share in the low-skilled workforce also increased steadily from 17 percent in 1990, to 26.9 percent in 2000 and 37.4 percent in 2010. Among the low-skilled immigrant workers, Latino immigrants' are the largest group, comprising 64 percent in 1990 and 79 percent in 2010. During the same period, Asian immigrants' share decreased slightly from 12 percent in 1990 to 10 percent in 2010.

[Table 1 about here]

Defining Immigrant Niches

We evaluate the concentration of immigrant workers with several indicators following previous work (Wilson 2003; Liu 2013). The first is a composition index, which measures the share of low-skilled immigrant workers in one individual occupation out of all low-skilled immigrants in the same MSA. The second measure is the concentration index, which measures the share of low-skilled immigrant workers in an occupation out of all workers in that same occupation. Our third and final measure is the niche index, which identifies in which occupations low-skilled immigrants are overrepresented. To calculate the niche index, we divide each

concentration index by the mean of all concentration indexes for the MSA. An occupation with a niche index of 1.5, is considered a “niche” (Liu, 2011, 2013).

Occupations are based on the Census Bureau's 2010 ACS occupation classification scheme, which represents an update from the 1990 version. The 2010 update to occupations offers researchers a consistent, long-term classification of occupations and a total of 493 categories. Our study is restricted to the civilian workforce, so we remove all observations for the unemployed and those in the military.

Calculating Occupational Concentration - HHI

We use the Herfindahl-Hirschman Index (HHI), as described by Lewis (1996), to capture the low-skilled immigrants’ employment concentration at the metropolitan statistical area (MSA) level. HHI indicates the evenness or competition within a given unit. Normally used to analyze market share, HHI has also been used to measure the occupational distribution of immigrants (Christopher and Leslie, 2015; Lester and Nguyen, 2015) as well as the spatial distribution of immigrant entrepreneurs (Liu, Painter, and Wang, 2014). One advantage of using HHI for employment concentration is that its value is directly comparable across metropolitan areas, regardless of in what occupations a region specializes.

Calculating HHI requires squaring the share of workers in each occupatEion in a metropolitan area and then summing the resulting figures:

$$HHI = \sum_{i=1}^{N} s_i^2$$

Where s_i is the share of employment in any one occupation, and N is the total number of occupation codes available in the census. The shares are entered as the percentage, so its value

can range from close to zero up to 10,000. A larger HHI value denotes higher occupational concentration whereas a lower value signals greater occupational diversity within an MSA.

[Figure 1 about here]

The overall direction of HHI for all low-skill immigrant workers and the two sub samples are displayed in Figure 1 for the period 1990 through 2010. Overall for the nation, HHI declined slightly from 1990 to 2010 from a value of 454 to 409, indicating some occupation dispersion among low-skilled immigrants. However, there are far more significant decreases over time among Latino and Asian low-skilled immigrants. Low-skilled Asian immigrants have seen decreases in occupational correlation across both decades, while Latino saw little additional change between 2000 and 2010. Of note, both subsamples are more concentrated than all low-skilled workers collectively, while Asians retain the greatest degree of concentration.

[Table 2 about here]

The HHIs for the ten highest and lowest ranked metropolitan areas in 2010 are arrayed in Table 2. Several established immigrant gateways, i.e. Chicago, Los Angeles, Miami, and New York, appear among the metropolitan areas with the lowest HHIs, or highest occupational diversity. This may be due to that fact that immigrants have long settled in these metropolitan areas and made their way into a larger number of occupations. Earlier comparative analysis by Liu (2011) across three metropolitan areas shows that the occupational concentration is most prevalent in the emerging gateway of Washington D.C. as compared to Chicago and Los Angeles. For all immigrants, and Latinos in particular, metropolitan areas in Western states have the largest concentrations. Seven of the top ten are in California specifically, while two others are in the Western region. Conversely, the West appears to be the region where Asian immigrants have the lowest occupational concentrations, with four of the top ten located in

Florida. The ten metropolitan areas with the lowest HHI for Asians immigrants feature seven from the West, with five being in California and two in Washington. Clearly, there exists substantial variation in occupational clustering at the regionally level, which can best be examined with a multivariate model.

Empirical Model and Variables

In order to analyze occupational concentration at the metropolitan level, we model the effects of demographic factors, economic conditions, and the policy environment. For demographic factors, the total population in included in order to control for the total size of the region. Despite limiting the study to the largest 100 metros in terms of immigrant population in 1990, the sample ranges from New York City with 17 million residents to Las Cruces, NM with a population of 200,000. Larger regions would be expected to have more diversified economies overall, and thus greater occupational diversity or lower occupational concentration.

The model also accounts for the size of the total immigrant community in a metropolitan area, measured by the share of the total population that is foreign born. Larger total immigrant populations might enable its immigrants to penetrate into greater number of job sectors, increasing employment diversity. In addition, the share of the total population that is African-American is included as minority groups are expected to compete in the low-skilled labor market, which may reduce the number of potential occupations for immigrant workers. (Borjas, 1987; Liu, 2013).

We also control for the educational distribution of the metropolitan area using the ratio of high skilled to low-skilled immigrants, as developed by Hall et al (2011). High-skilled individuals refer to those with college degree or above while the low-skilled are workers without

a high school degree. This ratio captures the relative educational distribution among immigrants in a given metropolitan area, with higher values indicating that high-skilled immigrants are more concentrated in such locations (Hall et al 2011). Lester and Nguyen (2016) suggests that higher immigrant human capital is associated with lower labor market diversity and higher specialization in general. Thus, we expect that a greater share of high-skilled immigrants will concentrate the low-skilled occupations, as they become further bifurcated within the labor market.

The final demographic variable we control for is the mobility of the region. Migration can affect levels of occupational concentration, as the movement of individuals in and out of a region may create new opportunities and a more fluid job market. We use data from the Current Population Survey for the share of individuals in a metropolitan area who lived in a different state the year prior[2].

In addition to the demographic characteristics described above, we also include several variables related to the urban economy. The first measure we use for local economic structure is economic diversification, which compares each metropolitan area to the nation with regards to the proportion of jobs in the goods-producing, service, and government sectors. The final index is the sum of differences for those three sectors and a greater level of economic diversity should be associated with lower rates of occupational concentration (Malizia and Ke, 1993).

We also include the income inequality of the region, using the Gini coefficient for the distribution of economic resources throughout a community (Saez and Zucman, 2016). Chetty et al. (2014) suggest that the distribution of wages within a region effects the opportunities an

[2] While many metropolitan areas cross state lines, inter-state migration is the best measure of significant re-locations available. The reason for not using Census is because its mobility question changed from a 5-year duration in decennial census to a 1-year duration in the American Community Survey since 2005, making this variable not comparable across decades.

individual possesses. We predict that metropolitan areas with greater income inequality will have higher occupational concentration, as there will be fewer opportunities for mobility and the transition across employment sectors would more difficult.

In addition, we include housing affordability of the region as an additional economic control as changing occupations can be costly, and therefore more difficult in regions with higher costs (Levine, 1998). We measure regional affordability by the share of households in each metropolitan area spending over 35 percent of their income on housing, and predict that it should increase occupational concentration.

We incorporate two policy variables into the model. The first is the minimum wage, a policy instrument that can restrict the labor market opportunities for low-wage workers (Neumark and Washer, 2006). Orrenius and Zavodny (2008) found minimum wages do not effect immigrant employment or wages differently than the native-born, but did not study the effect of wage floors on occupational concentration. The minimum wage has typically been established at the federal and state level, so we use the wage level of the principal state for each metropolitan area. Historical minimum wage data is available for all states from Rand's State Statistics Service.

The second variable is union membership, which has been shown to have a substantial effect on individual wages (Budd and Na, 2000), and more broadly to decrease income inequality (Card, 2001; Western and Rosenfeld, 2011). Immigrants have been shown to join unions at a higher propensity than the native born (Canton, 2013; Rosenfeld and Kleykamp, 2009) which should act to further concentrate workers in those protected industries. Using data gathered from an online database developed by Hirsch and Macpherson (2003), we predict that the rate of union membership in a region will increase occupational concentration among low-skilled immigrants.

Hirsch and MacPherson (2003) gather their data from the Current Population Survey, which does not have respondents from every metropolitan area in every year; thus, the total sample size is reduced to 281 with the inclusion of union rates.[3]

Finally, we include the region and year dummies to control for any unobserved spatial or temporal variations. Summary statistics along with their brief definitions are shown in Table 3.

[Table 3 about here]

As HHI measures the concentration of employment, metropolitan areas with small numbers of immigrants, particularly of either Latino or Asian immigrants, would have artificially high values. Therefore, we set a minimum population of 5,000 for Latino immigrants and Asian immigrants for their respective regression analysis. This threshold removes fifteen and ten metropolitan areas respectively in those analyses, resulting in 266 and 271 MSAs in our final analysis, as compared to a sample of 281 MSAs for all immigrants. The final regressions include robust standard errors to correct for any heteroskedasticity. Our model is expressed as:

$$\begin{aligned} HHI = {} & (Log)\ Total\ Population + \%\ Immigrant\ Population\ + \%\ African - Americans \\ & + High - Low\ Skill\ Ratio + Inter - State\ Migration \\ & + Economic\ Diversification + Income\ Inequality \\ & + Housing\ Affordability + State\ Minimum\ Wage + Union\ Membership \\ & + Region + Year \end{aligned}$$

Results

Niche Analysis

[3] It should be notes those same observations would have been lost from the inclusion of inter-state mobility from the Current Population Survey

Table 4 through Table 6 portray the top 20 employment niches for all low-skilled immigrants (Table 4), low-skilled Latino immigrants (Table 5), and low-skilled Asian immigrants (Table 6) respectively for 1990, 2000, and 2010. In each table, we present information on the ranking of the niche in the given year as well as the composition, concentration and niche values for 2010.[4] Niches that are in the top twenty across all three decennial observation are bolded.

[Tables 4-6 about here]

Between 1990 and 2010, 12 niches remain among the top 20 list for all low-skilled immigrants (Table 4). For low-skill immigrant workers, the largest occupational niches are fairly consistent across times. The largest two niches, graders and sorters of agricultural products and agricultural workers, have held the top two spots across all three observations. In fact, the top 7 niches in 2010 were all in the top 10 two decades earlier. The largest growth in concentrations are generated by occupations related to construction while the most significant declines relate to assembly and manufacturing. These changes are largely in line with shifts in the overall national economy as it transitioned from a manufacturing-based to a service-based economy and the continuous growth of the construction and hospitality sector. The top 20 niches together employ nearly a quarter of all low-skilled immigrant workers across the decades.

Latino workers' occupational patterns (Table 5) are to some extent similar to that for all low-skilled workers given their over-representation. A higher share of Latino immigrant workers are employed in top 20 niches than immigrants as a whole, though that share declined from 39.3 percent in 1990 to 34.7 percent in 2010. However, it should be noted that occupational concentration is still a pronounced feature of the labor market despite the slight decline across

[4] In the interest of space only the 2010 figures are displayed; indices for 1990 and 2000 are available upon request.

decades. The top occupations show the particular concentration of low-skill Latino immigrants in occupations related to construction and agriculture.

Asian immigrants' participation in the low-skilled labor market (Table 6) features both similar and different niches as compared to Latino immigrants, testifying to the fact that the networks that link immigrants to niches are shaped by ethnicity. Of note, while tailors have declined as a niche among Latino immigrants, it has remained among the largest occupations for Asian immigrants across decades. More broadly, several occupations have moved into the top 20 list where low-skilled Asian workers are most overrepresented, such as personal appearance workers, gaming service workers, shoe machine operators, and food cooking machine operators. These occupations largely show the growth of service work among low-skilled Asian immigrants. In addition, Asian-specific niches also demonstrate greater diversity and variation over time, with only 9 niches consistently ranked in the top 20 list across years in such occupations as sewing machine operators and tailors. At the same time, similar to their Latino counterparts, the largest 20 niches employ 35.6 percent of Asian low-skilled immigrants in 1990 and 30.7 percent in both 2000 and 2010.

MSA-level Regression Analysis

The second set of analyses comprises a series of regression conducted at the MSA-level analysis that test a series of variables on low-skilled immigrants' relative occupational concentration for three groups – all immigrants, Latino immigrants, and Asian immigrants (Table 7, column 1-3). In general, the three models behaved as predicted, with the results for all immigrants being the most consistent with expectations. For Latino and Asian immigrants, the results are generally similar but the differences highlight the variations across immigrant groups.

[Table 7 about here]

Across all three models, larger metropolitan areas tend to have higher levels of occupational diversity, holding other demographic and economic characteristics constant. For the sample of all immigrants, a one percent increase in the MSA's total population is associated with a .2 percent reduction in the HHI, a result that is generally consistent across samples. The immigrant share of the total population is also associated with lower levels of occupational concentration, although that difference was only significant in one of the three samples. In the case of Latino immigrants, a one percent increase in the total immigrant population of a region is associated with a .8 reduction in occupational concentration. This indicates that more expansive ethnic networks as a result of having a larger number of total immigrants in the same region provides opportunities for Latino immigrants to enter into more occupations. This finding also reflects HHI patterns observed earlier that more established immigrant gateways tend to feature greater occupational diversity.

The share of African-Americans in the MSA has different effects across the three subsamples. For Latino immigrants, a higher share of African-Americans in the region increases occupational concentration, though this effect is only significant at the .1 level. Conversely, an increase in African-Americans lowers the occupational HHI for Asian workers, holding all else constant. This result suggests that African-American workers and Latino immigrants might have greater direct competition in the low-skilled labor market.

The educational attainment of a community is associated with a more diversified occupational distribution for all immigrants and Latino immigrants, but not Asian immigrants. A one-unit increase in the ratio of high-skilled to low-skilled immigrants in a region correlates with a decrease in occupational concentration of roughly .4 percent, contrary to our initial expectation.

General discussions of global cities and economic restructuring suggest that an expanding high-skilled labor force would also create demand for the low-skilled workforce to perform various complementary tasks (Sassen, 2001; Florida 2002). Our findings suggest this might apply to the immigrant population as well.

As predicted, MSAs with greater residential mobility appears to be associated with increased opportunities in the low-skilled labor market. For all workers, a one percent increase in the number of residents in a region who lived in a different state the year prior correlated with a 3 percent decrease in occupational concentration. However, that finding was insignificant for the two sub-samples.

A more diverse economy is linked with expanded occupational choices across all three samples. In the case of all immigrant workers, a 1 percent increase in the difference between the industrial structure of a region and the nation is associated with a 1.2 percent decrease in the HHI. In contrast, income inequality has a consistent and large effect on concentrating occupations. For all workers and Latino immigrants, a one-unit increase in the Gini coefficient is associated with a 5 and 3.3 percent increase in occupational concentration respectively. Similarly, regional affordability is also associated with higher rates of concentration for those same two groups. Metropolitan areas where housing is more costly might hinder the residential and occupational mobility of low-skilled immigrants whose housing choices can be relatively limited.

With regard to the policy environment, a higher state minimum wage is associated with an increase in the concentration for immigrant workers overall. Conversely, it has an almost equal effect in the opposite direction for Asian immigrants. It is important to recall that Asian

immigrants are employed in often disparate occupations from Latino immigrants, some of which might have higher wage rates, but this is an area that deserves further investigation.

Union membership generally has a muted effect, but is shown to be associated with increased concentration among Latino workers. A 1 percent increase in union membership in an MSA is associated with a .02 percent increase in occupational concentration for Latino workers. This might be attributable to the specific occupations that Latino immigrants cluster in and again requires future research.

Finally, regions are shown to have moderate effects on levels of occupational concentration. For the sample of all workers, those in the Northeast and South have significantly less occupational concentration than those in the comparison group of the Midwest. The Northeast region loses significant when looking at either the Asian or Latino immigrants separately, a result that derives largely from the reduction of observations from that region in the two subsamples. However, the effect of being in a Western state differs between subsamples, with a positive effect on the concentration index among Latino workers, but a negative coefficient for Asian workers. The year 2000 and 2010 both saw a diluting of the employment concentration to various extent as compared to 1990, especially for Asian immigrants, a result that reflects the bivariate relationship displayed in figure 1.

Conclusions and Discussion

This research provides a temporal and spatial examination of the changing patterns of employment niches occupied by low-skilled immigrant workers in the United States from 1990 to 2010. Using census and American Community Survey data from the corresponding years, we offer a systematic overview of the evolving dynamics of low-skilled labor market for Latino and

Asian immigrants through the lens of occupational niches and a concentration index. We find a high level of consistency in terms of the top niches occupied by immigrant workers over the last two decades, though new niches have formed in recent decades, arising from a new service- and consumption-based economy. In particular, these changes are observed in healthcare and hospitality industries. Concurrently, some occupations in manufacturing industries were phased out of the list of largest niches, such as sewing machine operators, assemblers and fabricators, electrical assemblers, tailors, and dressmakers and sewers.

In the past two decades, the overall level of employment concentration has declined to various degrees for all groups, an indication of low-skilled immigrants' expanded occupational distribution. However, despite the decreases, occupational concentration is still at high overall levels. Asian immigrants show both greater strides towards occupational diversity and faster movement into new niches. Certain niches, such as cashiers, waiters and waitresses, hairdressers, hairstylists, and cosmetologists, personal appearance workers, stock clerks and order fillers, and laundry and dry-cleaning workers are unique to Asian immigrants, attesting to the role of ethnic networks in directing different groups to different occupations.

Spatially, we detect substantial geographic variation of occupational concentration among a sample of 100 MSAs. We find that metropolitan areas with larger total and immigrant populations, a larger ratio of high-skilled to low-skilled immigrants, greater residential mobility, as well as more diverse economy can expand low-skilled immigrants' occupational choices. However, factors like higher income inequality and less affordable housing in a locality are associated with higher employment concentration.

These findings point towards policy options cities and regions may consider to facilitate economic mobility for low-skill immigrants. Expanding the affordable housing choices could be

important for low-skilled immigrants due to their often limited budgets. Providing affordable housing, either by protections or loosening zoning restrictions, may help to disperse low-skilled immigrants across more occupations.

Increases in state and local minimum wages, particularly to a living wage, have been proposed as one potential and partial remedy for growing inequality; but our findings here imply potential unintended consequences. State minimum wage has the effect of increasing occupational concentration for all immigrants, though not for Asian immigrants. The underlying mechanism might be tied to the disparate occupations and their associated wage rates for different immigrant groups. While the effect of minimum wage laws are generally studied through the lens of lost employment, we here raise the additional concern regarding its effects on the occupational distributions of the labor market as well. Relatedly, a higher share of union membership is associated with greater occupational clustering, an effect that is only significant for the Latino immigrants. Again, this is likely attributable to variation in union membership across different occupations. However, it's role in further concentrating workers is worth noting.

Our findings have additional implications for economic development and workforce development scholarship and practice, especially towards low-skilled immigrants. Policies that seek to diversify local economic base, formalize immigrants' networks, ease immigrants' job search and matching processes, and increase immigrant' education should all have the effect of expanding low-skilled immigrants' career opportunities. Places such as Atlanta, Baltimore, Cleveland, Detroit and St. Louis are already implementing some of these workforce development initiatives as part of the welcoming cities framework (Huang and Liu, 2016). Broader policies that address local income inequality and expand the support for new residents

entering the region may also have an impact on the occupational mobility of low-skilled immigrants.

Further research is needed to provide more detailed analysis of group-specific niches and the mechanisms underlying their transitions. A cohort analysis, matching different immigrant workers of a similar age and tenure in the United States, could provide insight into how workers' careers evolve and how niches shift between immigrant groups. In addition, while we have defined low-skill workers here as being those without a high school degree, moderate increases in education through high school or a vocational training program may have significant effects on the occupational choices available to immigrant groups. Further studies looking at the differences between low and medium skill immigrant workers, and the impacts that education can have would be a valuable addition to relevant policy discussions.

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Table 1. Changing Composition of Immigrant Workers, 1990-2010

	1990		2000		2010	
Total Workforce	147,397,743	100%	166,934,897	100%	179,688,868	100%
Immigrant workforce	14,344,200	9.7%	22,928,360	13.7%	29,681,043	16.5%
Total Low-skilled	29,980,719	100%	29,462,024	100%	21,481,347	100%
Immigrant Low-skilled	5,104,347	17.0%	7,919,182	26.9%	8,029,143	37.4%
Latino Immigrant Low-Skilled	3,253,314	64%	5,818,225	73%	6,371,900	79%
Asian Immigrant Low-Skilled	612,156	12%	855,777	11%	809,916	10%
Total Medium-skilled	86,646,865	100%	96,564,786	100%	106,546,491	100%
Immigrant Medium-skilled	6,099,123	7.0%	9,313,017	9.6%	13,213,713	12.4%
Latino Immigrant Medium-Skilled	1,869,330	31%	3,487,237	37%	6,032,965	46%
Asian Immigrant Medium-Skilled	1,316,234	22%	1,970,829	21%	2,580,857	20%
Total High-skilled	30,770,159	100%	40,908,087	100%	51,661,030	100%
Immigrant High-skilled	3,140,730	10.2%	5,696,161	13.9%	8,438,187	16.3%
Latino Immigrant High-Skilled	442,517	14%	827,194	15%	1,420,222	17%
Asian Immigrant High-Skilled	1,205,564	38%	2,309,921	41%	3,611,447	43%

Source: 1990 and 2000 decennial census and 2006-2010 ACS 5 year sample
Note: Low-skill workers are those without a high school degree. Medium-skill refers to workers with a high school degree (or equivalent) but no college degree. High-shill workers possess a college degree or higher.

Table 2. Occupational HHI Index For Low-Skilled Immigrant Groups by MSA, 2010

All Immigrants	HHI	Latino Immigrants	HHI	Asian Immigrants	HHI
National Average	409	National Average	540	National Average	538
Top 10 MSAs with largest HHI					
Visalia-Tulare-Porterville, Ca	2498	Visalia-Tulare-Porterville, Ca	2659	Corpus Christi, Tx	1563
Yakima, Wa	1847	Yakima, Wa	1894	Bridgeport, Ct	1420
Fresno, Ca	1554	Fresno, Ca	1777	Fort Myers-Cape Coral, Fl	1296
Bakersfield, Ca	1341	Bakersfield, Ca	1441	Mcallen-Edinburg-Pharr-Mission, Tx	1250
Salinas-Sea Side-Monterey, Ca	1227	Salinas-Sea Side-Monterey, Ca	1397	Melbourne-Titusville-Palm Bay, Fl	1153
Santa Barbara-Santa Maria, Ca	1032	Ann Arbor, Mi	1296	Daytona Beach, Fl	1033
Merced, Ca	1026	Merced, Ca	1180	Fort Pierce, Fl	970
Santa Cruz, Ca	1004	Santa Barbara-Santa Maria-Lompoc, Ca	1125	Trenton, Nj	909
Yuma, Az	855	Santa Cruz, Ca	1112	Santa Cruz, Ca	865
Ann Arbor, Mi	577	Anchorage, Ak	911	Akron, Oh	841
Bottom 10 Msas With Lowest HHI					
Philadelphia, Pa/Nj	242	Fort Lauderdale-Hollywood, Fl	300	Chicago, Il	311
Allentown-Bethlehem-Easton, Pa/Nj	242	New Haven-Meriden, Ct	299	Tacoma, Wa	303
Tampa-St. Petersburg-Clearwater, Fl	241	Dallas-Fort Worth, Tx	295	Philadelphia, Pa/Nj	296
Miami-Hialeah, Fl	240	Greensboro-Winston Salem-High Point, Nc	285	Houston-Brazoria, Tx	291
Tacoma, Wa	235	New York, Ny-Northeastern Nj	281	San Diego, Ca	287
Worcester, Ma	234	Providence-Fall River-Pawtucket, Ma/Ri	278	Stockton, Ca	280
Los Angeles-Long Beach, Ca	228	Chicago, Il	273	Seattle-Everett, Wa	276
Detroit, Mi	227	El Paso, Tx	268	San Jose, Ca	263
Providence-Pawtucket, Ma/Ri	210	Los Angeles-Long Beach, Ca	251	Los Angeles-Long Beach, Ca	254
Buffalo-Niagara Falls, Ny	208	Miami-Hialeah, Fl	240	San Francisco-Oakland-Vallejo, Ca	233

Source: 2006-2010 ACS 5 year sample from IPUMS

Table 3. Definition and Summary Statistics of MSA-Level Regression Analysis

Variable	N	Mean	Min	Max	Definition
HHI All	300	412	189	2498	HHI for all low skill immigrants
HHI Latino	300	539	185	2659	HHI for Latino low skill immigrants
HHI Asian	300	540	233	1563	HHI for Asian low skill immigrants
Total Population (millions)	300	1.94	0.49	17.76	Total population (logged)
Immigrant Population (%)	300	15.0%	2.10%	61.50%	Share of total population who are immigrants
African-Americans (%)	300	8.96%	0.21%	33.51%	Share of total population who are African-Americans
High-Low Skill Ratio	300	1.03	0.05	7.53	Ratio of college educated immigrants to those without high school degree, as defined by Hall et al
Economic Diversity	300	0.111	0.017	0.336	Sum of Differences from National economy for Goods-producing, service, and government sectors
State Minimum Wage	300	6.776	4.114	8.55	State minimum Wage for metropolitan area's principle city
Union Membership	281	13.3%	1.1%	35.0%	Share of workforce registered in unions
Inter-State Migration Rate	283	3.5%	0.0%	13.3%	Percentage of residents in metropolitan area who lived in a different state in previous year
Income Inequality	300	0.549	0.482	0.665	Gini Coefficient
Housing Affordability	300	63.2%	43.8%	74.5%	Percentage of residents spending over 35 percent of household income on housing
Region					Four Census Designated Regions: West, Midwest, Northeast, South
Year					Three observations, 1990, 2000 and 2010

All data from IPUMS except Migration Rate (CPS) and Union Membership (Hirsch and Macpherson (2003))

Table 4. List of top 20 Low-Skilled Immigrant Niches 1990-2010

Occupation	Niche Ranking 1990	2000	2010	2010 values Concentration	Composition	Niche
graders and sorters, agricultural products	**1**	**1**	**1**	40.0%	0.6%	12.552
agricultural workers, nec	**2**	**2**	**2**	29.5%	6.4%	9.2392
plasterers and stucco masons	**5**	**4**	**3**	27.9%	0.2%	8.7547
sewing machine operators	**4**	**3**	**4**	26.5%	1.5%	8.3037
pressers, textile, garment, and related materials	**8**	**5**	**5**	24.9%	0.3%	7.8239
packers and packagers, hand	**9**	**7**	**6**	21.2%	2.2%	6.6394
packaging and filling machine operators and tenders	**7**	**6**	**7**	19.5%	1.1%	6.1139
drywall installers, ceiling tile installers, and tapers	33	20	8	19.2%	0.7%	6.0227
butchers and other meat, poultry, and fish processing workers	22	8	9	18.3%	1.0%	5.7409
cleaning, washing, and metal pickling equipment operators and tenders	**12**	**40**	**10**	17.3%	0.0%	5.4369
roofers	46	24	11	16.2%	0.8%	5.0782
cement masons, concrete finishers, and terrazzo workers	30	18	12	15.8%	0.3%	4.9484
first-line supervisors of farming, fishing, and forestry workers	**13**	**10**	**13**	15.1%	0.2%	4.7295
laundry and dry-cleaning workers	**16**	**22**	**14**	15.1%	0.7%	4.721
maids and housekeeping cleaners	**6**	**16**	**15**	15.0%	4.8%	4.7067
tailors, dressmakers, and sewers	**3**	**9**	**16**	14.4%	0.3%	4.5072
insulation workers	43	28	17	14.1%	0.1%	4.4325
helpers--production workers	21	13	18	13.9%	0.2%	4.3654
dishwashers	*Not Niche*	23	19	13.8%	1.0%	4.322
shoe machine operators and tenders	51	42	20	13.6%	0.0%	4.2638
textile bleaching and dyeing, and cutting machine setters, operators, and tenders	19	11	21			
forest and conservation workers	41	12	67			
jewelers and precious stone and metal workers	10	14	51			
construction laborers	25	15	27			
cutting workers	17	17	29			
helpers--installation, maintenance, and repair workers	28	19	31			
bakers	14	27	28			
food preparation and serving related workers, nec	18	30	41			
electrical, electronics, and electromechanical assemblers	11	31	32			
plating and coating machine setters, operators, and tenders, metal and plastic	20	38	44			
agricultural inspectors	15	*Not Niche*	*Not Niche*			
% employed in top 20 niches	25.6%	24.6%	22.4%			

Note: Composition = Immigrant workers in an occupation/all Immigrant workers
Concentration = Immigrant workers in an occupation/all workers in an occupation.
Niche = Immigrant concentration in one occupation/mean Immigrant concentration
Source: Source: 1990 and 2000 decennial census and 2006-2010 ACS 5 year sample

Table 5. List of Top 20 Low-Skilled Latino Immigrant Niches 1990-2010

Occupation	Niche Ranking 1990	2000	2010	2010 values Concentration	Composition	Niche
graders and sorters, agricultural products	**1**	**1**	**1**	37.30%	0.70%	15.11
agricultural workers, nec	**2**	**2**	**2**	28.20%	8.00%	11.44
plasterers and stucco masons	**3**	**3**	**3**	25.50%	0.20%	10.33
pressers, textile, garment, and related materials	**12**	**4**	**4**	20.70%	0.30%	8.4
drywall installers, ceiling tile installers, and tapers	23	13	5	18.40%	0.80%	7.44
packers and packagers, hand	**8**	**6**	**6**	18.30%	2.40%	7.4
sewing machine operators	**4**	**8**	**7**	17.40%	1.30%	7.03
packaging and filling machine operators and tenders	**5**	**5**	**8**	16.70%	1.30%	6.76
cleaning, washing, and metal pickling equipment operators and tenders	10	32	9	16.40%	0.00%	6.65
roofers	37	17	10	15.50%	0.90%	6.27
butchers and other meat, poultry, and fish processing workers	28	9	11	15.10%	1.00%	6.12
cement masons, concrete finishers, and terrazzo workers	**19**	**16**	**12**	15.00%	0.30%	6.08
first-line supervisors of farming, fishing, and forestry workers	**6**	**7**	**13**	14.50%	0.30%	5.87
insulation workers	34	24	14	13.50%	0.20%	5.48
maids and housekeeping cleaners	7	23	15	11.80%	4.90%	4.79
grounds maintenance workers	**13**	**15**	**16**	11.80%	4.60%	4.79
laundry and dry-cleaning workers	21	26	17	11.60%	0.70%	4.71
helpers, construction trades	33	19	18	11.60%	0.30%	4.71
construction laborers	**17**	**12**	**19**	11.30%	5.40%	4.57
dishwashers	*Not Niche*	22	20	11.20%	1.10%	4.56
helpers--production workers	18	14	23			
textile bleaching and dyeing, and cutting machine setters, operators, and tenders	15	11	25			
helpers--installation, maintenance, and repair workers	25	20	29			
cutting workers	14	21	30			
plating and coating machine setters, operators, and tenders, metal and plastic	16	38	37			
food batchmakers	20	33	38			
hazardous materials removal workers	*Not Niche*	18	47			
tailors, dressmakers, and sewers	11	37	48			
forest and conservation workers	27	10	55			
agricultural inspectors	9	*Not Niche*	*Not Niche*			
% employed in top 20 niches	39.3%	37.2.7%	34.7%			

Note: Composition = Immigrant workers in an occupation/all Immigrant workers
Concentration = Immigrant workers in an occupation/all workers in an occupation.
Niche = Immigrant concentration in one occupation/mean Immigrant concentration

Source: Source: 1990 and 2000 decennial census and 2006-2010 ACS 5 year sample

Table 6. List of Top 20 Low-Skilled Asian Immigrant Niches 1990-2010

Occupation	Niche Ranking			2010 Values		
	1990	2000	2010	Concentration	Composition	Niche
personal appearance workers, nec	*Not Niche*	1	1	12.04%	4.71%	32.42
sewing machine operators	**1**	**2**	**2**	7.11%	3.45%	19.14
electrical, electronics, and electromechanical assemblers	**2**	**3**	**3**	5.31%	1.80%	14.3
tailors, dressmakers, and sewers	**3**	**4**	**4**	3.93%	0.71%	10.57
gaming services workers	*Not Niche*	6	5	3.74%	0.71%	10.08
jewelers and precious stone and metal workers	**4**	**5**	**6**	3.35%	0.25%	9.008
textile knitting and weaving machine setters, operators, and tenders	30	12	7	2.42%	0.07%	6.521
shoe machine operators and tenders	*Not Niche*	69	8	2.42%	0.02%	6.506
pressers, textile, garment, and related materials	**7**	**7**	**9**	2.25%	0.23%	6.046
food cooking machine operators and tenders	*Not Niche*	25	10	2.09%	0.05%	5.623
textile bleaching and dyeing, and cutting machine setters, operators, and tenders	46	16	11	2.04%	0.06%	5.482
adhesive bonding machine operators and tenders	69	34	12	1.98%	0.06%	5.331
helpers--production workers	**19**	**10**	**13**	1.96%	0.21%	5.275
assemblers and fabricators, nec	**13**	**13**	**14**	1.96%	3.92%	5.263
butchers and other meat, poultry, and fish processing workers	8	22	15	1.93%	0.88%	5.194
textile, apparel, and furnishings workers, nec	44	19	16	1.92%	0.10%	5.165
packers and packagers, hand	**14**	**18**	**17**	1.91%	1.70%	5.136
food preparation workers	37	14	18	1.85%	2.96%	4.988
chefs and cooks	**5**	**8**	**19**	1.85%	8.53%	4.975
graders and sorters, agricultural products	**16**	**11**	**20**	1.85%	0.24%	4.971
laundry and dry-cleaning workers	10	17	22			
packaging and filling machine operators and tenders	9	15	23			
aircraft structure, surfaces, rigging, and systems assemblers	*Not Niche*	9	24			
cutting workers	18	27	25			
bakers	12	20	26			
food batchmakers	15	30	29			
maids and housekeeping cleaners	11	31	31			
food preparation and serving related workers, nec	6	28	33			
first-line supervisors of food preparation and serving workers	20	*Not Niche*	*Not Niche*			
structural metal fabricators and fitters	17	*Not Niche*	*Not Niche*			
% employed in top 20 niches	35.6%	31.8%	30.7%			

Note: Composition = Immigrant workers in an occupation/all Immigrant workers
Concentration = Immigrant workers in an occupation/all workers in an occupation.
Niche = Immigrant concentration in one occupation/mean Immigrant concentration

Source: Source: 1990 and 2000 decennial census and 2006-2010 ACS 5 year sample

Table 7. MSA Regression analysis

	HHI-All Immigrants (1)	HHI – Latino (2)	HHI - Asian (3)
Total Population (Log)	-0.213***	-0.251***	-0.264***
	(0.028)	(0.038)	(0.029)
Immigrant Population (%)	-0.258	-0.818**	-0.263
	(0.284)	(0.372)	(0.305)
African-Americans (%)	0.558	1.015*	-1.181***
	(0.436)	(0.560)	(0.455)
High-Low Skill Ratio	-0.407***	-0.396**	-0.078
	(0.127)	(0.175)	(0.130)
Economic Diversification	-1.205***	-0.911*	-1.380***
	(0.407)	(0.529)	(0.422)
State Minimum Wage	0.067**	0.056	-0.064*
	(0.033)	(0.043)	(0.035)
Union Membership	0.003	0.016***	-0.004
	(0.004)	(0.006)	(0.005)
Inter-State Migration Rate	-3.374**	-1.138	0.272
	(1.359)	(1.763)	(1.400)
Income Inequality	5.024***	3.385**	0.787
	(1.265)	(1.642)	(1.337)
Housing Affordability	1.620***	1.371*	-0.431
	(0.564)	(0.735)	(0.580)
Region: Northeast	-0.223***	-0.089	0.018
	(0.082)	(0.117)	(0.083)
Region: South	-0.165*	-0.114	-0.032
	(0.085)	(0.115)	(0.087)
Region: West	0.269***	0.225*	-0.323***
	(0.088)	(0.118)	(0.091)
2000	-0.087	-0.235***	-0.201***
	(0.058)	(0.075)	(0.058)
2010	-0.066	-0.075	-0.303***
	(0.105)	(0.137)	(0.105)
Constant	3.743***	5.458***	9.292***
	(1.071)	(1.407)	(1.121)
Robust Standard Errors	Yes	Yes	Yes
Observations	281	266	271
R2	0.509	0.370	0.440
Adjusted R2	0.485	0.338	0.412
Residual Std. Error	0.367 (df = 267)	0.468 (df = 252)	0.370 (df = 257)
F Statistic	21.319*** (df = 13; 267)	11.397*** (df = 13; 252)	15.525*** (df = 13; 257)

Note: *p<0.1; **p<0.05; ***p<0.01

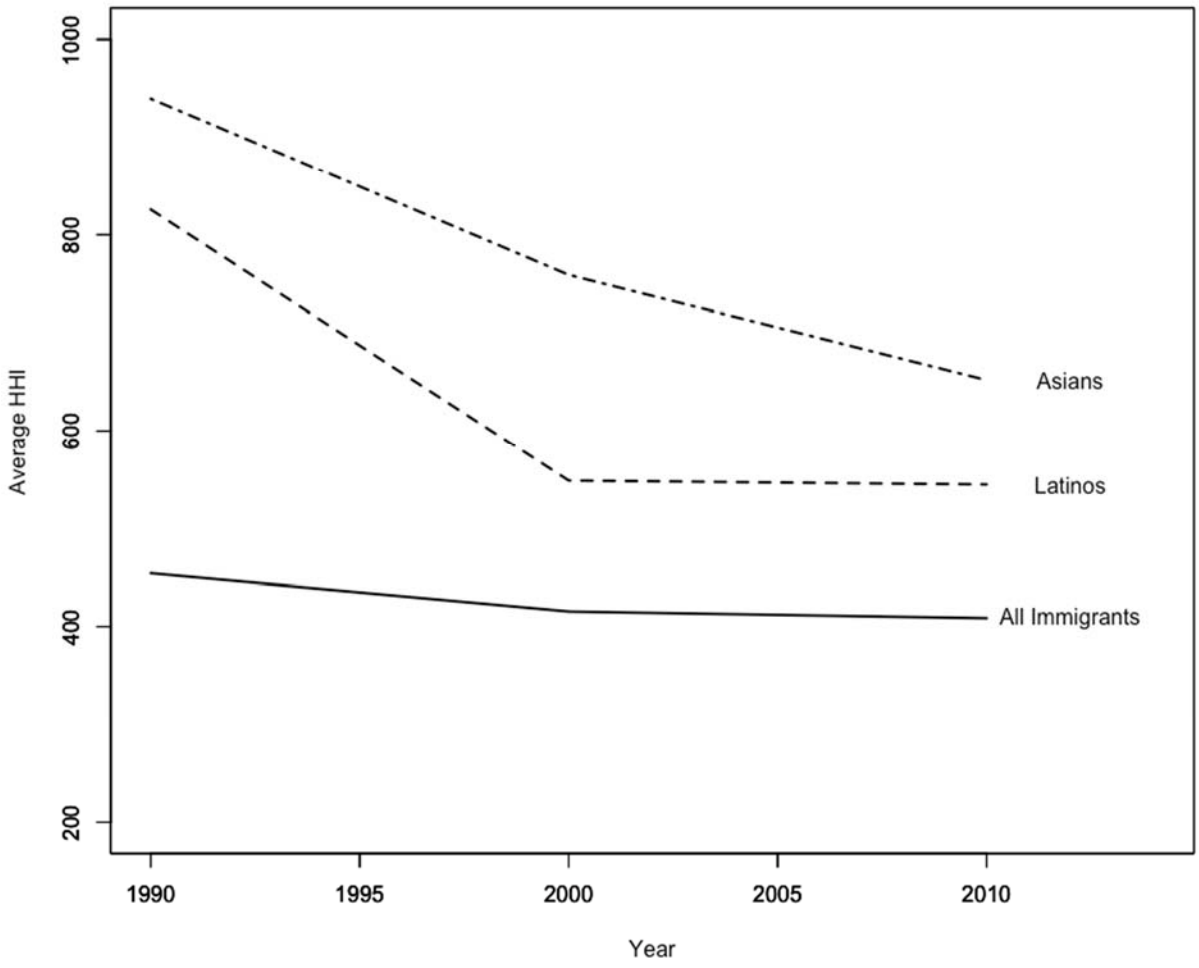

Figure 1. Average HHI by subgroup 1990-2010